ELECTRICAL ENGINEERING IN JAPAN
VOLUME 106
CONTENTS FOR 1986

Number 1

Page

PART A

Electrical and Electronics Materials, Plasma Physics, Nuclear Fusion, Precision Measurement and Instrumentation, Electromagnetic Theory and Nonlinear Oscillation

Dielectric Breakdown of High-Polymer Insulating Materials at Cryogenic Temperatures, by Sanhyon Kim and Katsumi Yoshino 1
Breakdown Characteristics of a Trigatron Gap and the Influences of the Electro-Negative Gas, by Youji Hayashi, Tatsuzo Hosokawa, and Giichi Ikeda 8
Combined Stress Degradation of Thermal Degradation and Surface Degradation due to Discharge of Epoxy Micaceous Insulations, by Hisayasu Mitsui, Hideo Akahori, Yoshiyuki Inoue, and Hiroshi Yoshida 21
Flashover Properties and Calculated Values of Binary Mixtures of SF_6, N_2, O_2 and Ar, by Shigemitsu Okabe and Teruya Kouno 29
Low Pressure Long Tap Discharge in Hydrogen, by Kanehiro Nobata and Tokuichi Kakijima 38

PART B

Electric Machinery, Power Apparatus, Energy Conversion, Magnetohydrodynamics, Electric Railway, Power Systems Planning, Power Distribution and Transmission

Analysis of Magnetic Characteristics of Laminated Cores for Establishing an Accuracy Standard of Joint Dimension, by Takayoshi Nakata and Yoshihiro Kawase 48
Stationary Pulsating MMF Effect in Single-Layered High-Speed LIM Taking into Account Finite Length of Primary Cores, by Sakutaro Nonaka, Tatsuya Furukawa, and Kokichi Ogawa 57
Effective Allocation and Operation of Dispersed Energy Storage Devices in Power System Restoration State, by Koichi Nara and Susumu Yamashiro 66
An Optimal Design Method for Incompressible EFD Electric Power Generation Duct, by Masaki Sato 77
Boundary Element Analysis of Single-Sided Linear Induction Motors, by Kokichi Ogawa and Sakutaro Nonaka 86
Starter Motor of Permanent Magnetic Field Type with Additional Auxiliary Pole, by Toshimi Abukawa, Kazuo Tawara, Noriyoshi Takahashi, Fumio Tajima, and Toshio Tomite 95
On-Line Stabilization of the Power System with Static Var Compensator by Eigenvalue Control, by Tsutomu Oyama, Yasuo Serizawa, and Yasuji Sekine 105
Extension of Output Power Range by Means of Harmonic Resonance of an Induction Generator Coupled with DC Link Converters, by Yoichi Hayashi and Noriaki Sato 113
Forced Commutation Thyristor Bridge Using Pulse Transformer, by Hiroshi Kazuno 122

Page

PART C

Solid-State Devices, Quantum Electronics, Integrated Circuits, Optoelectronics, Information Processing, Communication Systems, Computer Control, Learning Theory and Pattern Recognition

A Physical Interpretation of Synchronism, by Michifumi Li 132

Number 2

PART A

Electrical and Electronics Materials, Plasma Physics, Nuclear Fusion, Precision Measurement and Instrumentation, Electromagnetic Theory and Nonlinear Oscillation

Accelerated Test Method to Evaluate Tracking Resistance of Overhead Insulated Wires, by Makoto Nishida, Noboru Yoshimura, Fumitoshi Noto, Eiji Itoga, and Shoji Suga 1
Breakdown by Partial Discharge of Polyethylene Films-Liquid Nitrogen Composite System, by Yukio Mizuno, Syogo Kondo, Noriyuki Shimizu, Masamitsu Kosaki, and Kenji Horii 10
High Field Dielectric Properties of Polyethylene Films, by Tetsuro Tokoro, Hideki Shimizu, Masayuki Nagao, and Masamitsu Kosaki 19
A New Method for Reduction of Static Charge in Oil Flowing in Pipeline, by Masao Arimoto, Asao Ohashi, and Minoru Ueda 31
Analysis of Standard Deviation Obtained by Up and Down Method, by Masao Endo and Kazuyuki Hayamizu 38

PART B

Electric Machinery, Power Apparatus, Energy Conversion, Magnetohydrodynamics, Electric Railway, Power Systems Planning, Power Distribution and Transmission

Quick Torque Control of an Induction Motor by Means of Instantaneous Slip Frequency Control, by Isao Takahashi and Toshihiko Noguchi 46
Model Reference Adaptive Control-Based Armature Current Control for DC Motors in the Discontinuous Current Mode, by Haruo Naito and Susumu Tadakuma 54
Application of the Maximum Principle to the Start-Up Control of Induction Motors, by Hiroshi Hashimoto and Kageo Akizuki 62
Performance Improvement of Three-Phase Induction Motors Driven Through Asymmetrically Controlled Thyristors, by Yoshihiro Murai, Takeyoshi Kajita, and Taro Yoshida 70
Test Apparatus of Flashover Phenomena of DC Machines by Synchronized Trigger Control and Test Results, by Hisaya Sasamoto, Kazuo Tahara, Takayuki Matsui, Noriyoshi Takahashi, and Yoshihisa Ishikawa 79
Application of Kalman Filter to the Nodal Injection Correlation in Stochastic Load Flow, by Horoyuki Mori and Yasuo Tamura 89
Current Controlled PWM Inverter of High Current Response Speed and Low Harmonic Content, by Satoshi Ogasawara, Michiaki Nishimura, Hirofumi Akagi, and Akira Nabae 98
Secondary Resistance Identification of Induction Motor Using a Model Reference Adaptive System and the Identification Characteristics, by Hidehiko Sugimoto and Shinzo Tamai 106
An Approach to Speed Control of DC Motor with Two Inertias, by Kiyoshi Ohishi, Takeshi Myooi, Kouhei Ohnishi, and Kunio Miyaji 115
Theory and Experiment of Magnetic Bearing for Radial and Thrust Control, by Fumio Matsumura, Kouji Nakagawa, and Mamoru Kido 123
Simulation of Running Coupled Rail Cars Using a Control Theory of Bogie Truck for Damping Rail Oscillation, by Toshiko Nakagawa, Sakae Yamamura, and Kunio Nakanishi 131

Number 3

Page

PART A

Electrical and Electronic Materials, Plasma Physics, Nuclear Fusion, Precision Measurement and Instrumentation, Electromagnetic Theory and Nonlinear Oscillation

Light Emission Characteristics of Discharge Associated with Tracking Deterioration of Organic Insulating Materials, by N. Yoshimura, M. Nishida, Y. Takahashi and F. Noto 1
Tailored Pulse Current Dense Z-Pinch Discharge, by Shozo Ishii, Tsukushi Hara, Fujio Sonoda, Masahiro Fukuta and Izumi Hayashi 10
Toroidal Current Drive Experiment by $m = +1$, -1 Nonaxisymmetric Alfven Wave, by Mitsuaki Suzuki, Eiki Hotta, Hiroshi Ohta and Izumi Hayashi 17
Effect of Space Charge on the Breakdown Strength under Polarity Reversal, by Kiyoji Kaneko 25
Measurement of Impulsive Pressure by Means of Elastic Bar, by Tsutomu Fujimura, Kohji Isuzugawa and Akiyoshi Saiki 34
Boundary Element Analysis Using Revised Integration, by Masato Enokizono and Takashi Todaka 42
Thermally Stimulated Current Phenomena on Double-Layer Dielectric Films, by Taro Hino and Jia Xiang Yang 51

PART B

Electric Machinery, Power Apparatus, Energy Conversion, Magnetohydrodynamics, Electric Railway, Power Systems Planning, Power Distribution and Transmission

A Universal Theory for the Flux Feedforward Type Vector Control, by Satoshi Ogasawara, Hirofunu Akagi and Akira Nabae 59
DC Motor Control by Model Following Controller, by Itsuya Muta and Masahiko Iguchi . . 67
A Fast Calculation Method of Optimal Operating Strategy of Energy Storage Unit, by Kazushi Minagawa, Satoshi Morozumi, Ken-ichi Nishiya, Juan Hasegawa and Hajime Fujiwara 76
Approximate Three-Dimensional Finite Element Analysis of Magnetic Circuits Composed of Axially Symmetric Region and Rectangular Region, by Takayoshi Nakata, Yoshihiro Kawase, Hiroaki Funakoshi and Shokichi Ito 86
Coordinative Planning of Energy Storage System in Optimal Generation Mix, by Junichi Toyoda and Michinobu Kohno 95
Effects of Higher Harmonic Exciting Voltage on Synchronous Machine Running at Asynchronous Speed, by Kazuo Tsuboi and Hidemi Matsuura 103
A Method for Calculating the Operating Characteristics of Permanent Magnet Type Three-Phase AC Motor, by Akira Ishizaki, Tomoyuki Tabako and Kazuo Saito 112
Stabilizing Control of Long Distance Longitudinal Power System by Superconducting Magnetic Energy Storage, by Yasuharu Ohsawa, Hajime Miyauchi and Muneaki Hayashi . 121
Precise Simulation Model of Pulse-Phase Control Circuit for Bulk Power HV DC Transmission System, by Masahiro Ishikawa, Tsukushi Hara, Yutaka Kokai, Iwao Matori, Junichi Arai and Yasuji Sekine 127

Number 4

PART A

Electrical and Electronics Materials, Plasma Physics, Nuclear Fusion, Precision Measurement and Instrumentation, Electromagnetic Theory and Nonlinear Oscillation

A New Method of Measuring Trapped Charge in Insulators by Using Residual Voltage, by Futao Kaneko and Satoshi Kobayashi 1
Barrier Effect Due to Space Charges for Negative Impulse Voltage, by Kunihiko Hidaka and Yoshihiro Murooka 11

Page

Application of Finite Element Method to Analysis of Distributed Constant Circuits, by Shohei Kato 20
Eddy Current Speed Meter Using Galvanomagnetic Devices, by Akio Tanaka and Nobuo Takehira 29
Characteristics of Corona Discharge and Spark Breakdown in Nonuniform Field and Uniform Field Gaps in SF_6 Gas, by Akira Watanabe, Tatsuzo Hosokawa and Yasunori Miyoshi 37

PART B

Electric Machinery, Power Apparatus, Energy Conversion, Magnetohydrodynamics, Electric Railway, Power Systems Planning, Power Distribution and Transmission

Experimental Investigation on a Long Duration MHD Experimental Facility, by Yoshitomo Kusaka, Youzaburou Iwafuji, and Mitsuhiro Irino 47
Tank Frequency Control of Circulating Current Type Cycloconverter with High Frequency Tank Circuit, by Youngseok Kim, Shigeru Okuma, and Koji Iwata 58
A Two-Conductor Model for Lightning Surge Calculation, by Naoto Nagaoka and Akihiro Ametani 66
A Method for Calculating the Cooling Characteristics of Radial-Flow Type Internally Oil-Cooled Oil-Filled Cables, by Eiichiro Nakamura, Masao Ogino, Mamoru Kurata, Tsuneaki Maotai, Syotaro Yoshida, and Kazuya Akashi 76
Analysis of Three-Dimensional Asynchronous Field and Rotor Damper Characteristics of Superconducting Generator, by Miyoshi Takahashi, Masatoshi Watanabe, Noriyoshi Takahashi, and Kouji Tanaka 87
Stability Studies of a Parametric Induction Motor Using the Equivalent Linearization Model, by Yoshinori Sakamoto, Koichi Murakami, and Shinki Kikuchi 97
Torque Characteristics of Swing Motor with dc Field Winding, by Takashi Yano and Koji Yano 106
A Study on MAGLEV Vehicle Position Detecting System Using the Feeding Circuits, by Haruo Ikeda and Takashige Saijo 115

PART C

Solid-State Devices, Quantum Electronics, Integrated Circuits, Optoelectronics, Information Processing, Communication Systems, Computer Control, Learning Theory and Pattern Recognition

Monthly Load Forecasting Using GMDH, by Setsuo Sagara and Junichi Murata 125
Analysis of and Programs for Linear Active Networks Containing Switches, by Tadanori Tsukamoto, Kiyoshi Shimazu, and Tsunemoto Matsuura 133

Number 5

PART A

Electrical and Electronic Materials, Plasma Physics, Nuclear Fusion, Precision Measurement and Instrumentation, Electromagnetic Theory and Nonlinear Oscillation

Insulating Properties of Binary Gas Mixtures Consisting of Electro-Negative Gases, by Shigemitsu Okabe and Teruya Kouno 1
Tracking-Proof Paint in Printed Board Considering Protective Effect for Electrolytic Corrosion, by Kohin Kawamura, Toshiyuki Taniguchi and Fumitoshi Noto 12
Formulation of Electromagnetic Wave Analysis by Boundary Element Method and Its Application to Analysis of Radio Frequency Cavities, by Masao Washizu and Yoshio Tanabe 21

Page

PART B

Electric Machinery, Power Apparatus, Energy Conversion, Magnetohydrodynamics, Electric Railway, Power Systems Planning, Power Distribution and Transmission

Compensation Characteristics of Active Power Filter Using Multiseries Voltage Source PWM Converters, by Hirofumi Akagi, Satoshi Atoh and Akira Nabae 28
Operation Limit of a High-Frequency Power Source Using Cycloconverter and Its Characteristics as Viewed from the Power Source Side, by Tadashi Fukao, Mikihiko Matsui and Akira Chiba 37
An Algorithm for Detecting the Line Containing a Specified Swing Mode, by Hiroumi Saito and Jun-ichi Toyoda 47
Optimal Allocation of Measurements for Power System State Estimation Taking into Account Loss-of-Measurements, by Jun Hasegawa and Ken-ichi Nishiya 56
Correction and Accuracy of 2^n -Equal Distance Division of Long-Distance Transmission Lines, by Masaki Miyazawa and Minoru Kuboki 66
PWM and Phase Lead Combined Control of AC Power Circuit, by Kiyoshi Kinoshita and Yasuo Watanabe 73
Three-Dimensional Analysis of Dynamic Eddy Current of a Cryostat Outer Vessel in a Superconducting Magnetically Levitated Vehicle, by Sakutaro Nonaka and Tetsuzo Sakamoto 82
Delayed Current Zero Phenomena Caused by Transmission Line Faults, by Masuo Goto, Haruo Nohara, Isao Takashashi, Atsumi Watanabe and Tadao Kawai 91

PART C

Solid-State Devices, Quantum Electronics, Integrated Circuits, Optoelectronics, Information Processing, Communication Systems, Computer Control, Learning Theory and Pattern Recognition

Studies on the Origin of Irregular Voltage Characteristics for a Tin Microbridge, by Toshimi Matsui 101
Polynomic Nonlinear Regulator with Incomplete State Information, by Yoshiyuki Takeuchi 108
Analysis of a Cockcroft-Walton Circuit by a Newly Developed Graphical Method, by Yoshio Takamura 117
A Method for Detecting the Position of Linear Motor Vehicle Using Three-Phase Three-Conductor Induction Line, by Tohru Hatta, Tadashi Kusakabe and Takahiro Asai . . . 125
An Efficient Approximate Algorithm for Solving System Reliability Optimization Problems, by Ryoichi Sasaki and Yoshiki Kitamura 134

Number 6

PART A

Electrical and Electronics Materials, Plasma Physics, Nuclear Fusion, Precision Measurement and Instrumentation, Electromagnetic Theory and Nonlinear Oscillation

Electrochemical Doping in Heterocyclic Conducting Polymers and Their Electrical and Optical Properties, by Katsumi Yoshino, Tohru Takiguchi, Taketora Shiraishi, Shigenori Hayashi, and Keiichi Kaneto 1
Low Frequency Shielding of Moving Sheet Conductor, by Nobuo Takehira, Akio Tanaka, and Hitoshi Kondo 16
Boundary Element Method Using Analytical Integration for Three-Dimensional Laplace Problem, by Toshihiko Kuwabara and Tsuyoshi Takeda 25

Page

PART B

Electric Machinery, Power Apparatus, Energy Conversion, Magnetohydrodynamics, Electric Railway, Power Systems Planning, Power Distribution and Transmission

Stability Analysis of a Voltage Source PWM Inverter-Fed Induction Motor Drive System, by Takeshi Kishimoto, Keiji Matsumoto, Takayuki Kamakura, and Masakatsu Daijo . . 32

Digital Signal Processor Based High Speed Current Control of Brushless Motor, by Takaharu Takeshita, Kohji Kameda, Hironori Ohashi, and Nobuyuki Matsui 42

Estimation of Equivalent Voltage and Equivalent Reactance of Power System, by Kei Ohtsuka, Yuzo Yamada, Hiroyuki Tanaka, Katsuyoshi Neri, Sumio Yokokawa, and Yoshiteru Ueki 50

Phase Angle Analysis of Single-Phase Inductor Motor, by Akira Ozawa 59

Carter Coefficient of Iron Core with Magnetic Wedge for Rotating Machinery, by Shoji Isobe and Masakatsu Takemoto 67

A New Theory of Steady-State Stability Analysis of Synchronous Machines, by Junji Tamura, Toshiaki Murata, Ikuo Takeda, and Jun Hasegawa 74

Analysis of Surge Characteristics of Ground Wire and Tower System by Electromagnetic Field Theory, by Kohshi Okumura, Akira Kijima, and Shigeru Tani 81

Design of Power System Stabilizer Using Superconducting Magnet Energy Storage Device by Means of Singular Perturbation Method, by Yasunori Mitani, Kiichiro Tsuji, and Yoshishige Murakama 90

Development of Measuring Method of Line—to—Ground Admittance of Transmission/Distribution Systems, by Takashiro Iwatani 100

Power System Stability Improvement by Integrated Adaptive Control of Exciter, Turbine Valve and Shunt Damping Resistor, by Hiroshi Sugimoto, Kunio Matsushita, Tatsumi Maeda, Fujio Ishiguro, Masaru Shimomura, and Seiichi Tanaka 107

Implementation and Experiments of Integrated Control of Exciter, Turbine Valve and Shunt Damping Resistor, by Hiroshi Sugimoto, Kunio Matsushita, Tatsumi Maeda, Fujio Ishiguro, Masaru Shimomura, and Seiichi Tanaka 117

Optimal Design of Homogeneous Field Magnet by Coupling Procedure Using Boundary Element Method and Optimizing Method, by Atsushi Ishiyama, Toshiaki Yokoi, Hiroshi Aoki, and Takashi Onuki 127

Analysis of Levitating and Lateral Forces of Magnetic Levitating System of Permanent Magnetic Repulsion Type, by Daiki Ebihara, Kazuhiko Imagawa, and Mitsuru Watanabe